

## **ABSTRACT**

A process for fabricating monolithic membrane structures having air gaps is disclosed, comprising the steps of: providing a wafer; depositing and patterning a protective layer on the wafer; providing a trench in the wafer; depositing and patterning a metal in the trench; depositing and patterning a sacrificial layer on the metal; depositing and patterning a membrane pad on the sacrificial layer; providing a polymeric film on the protective layer and sacrificial layer, wherein part of the polymeric film has a tensile stress; and releasing part of the polymeric film from the protective layer and sacrificial layer, wherein the tensile stress of a portion of the polymeric film releases the portion of the polymeric film from the wafer and generates the air gap.